

Historic, archived document

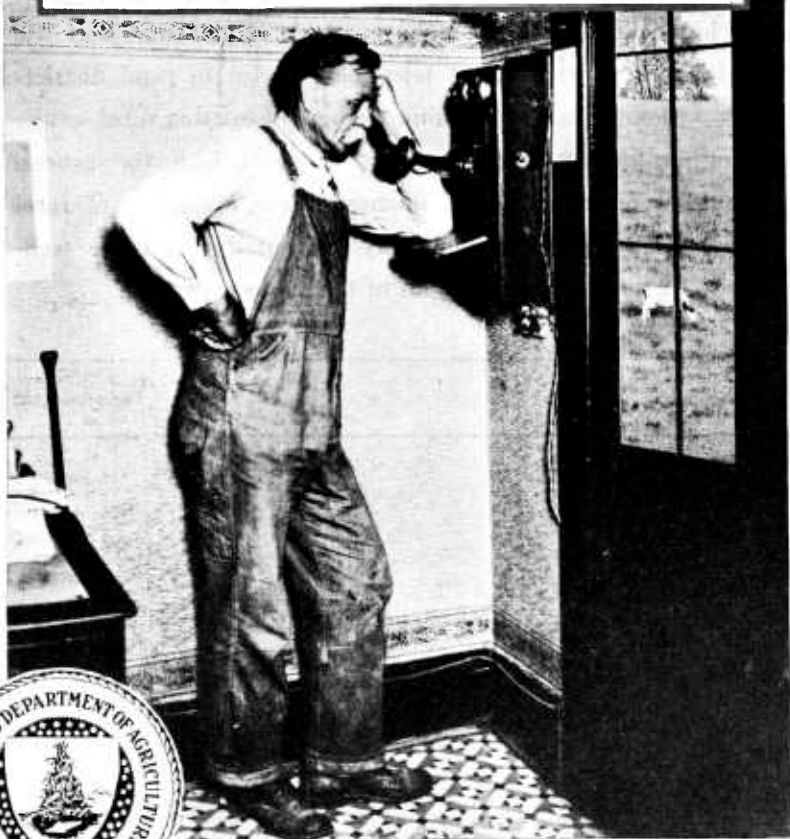
Do not assume content reflects current scientific knowledge, policies, or practices.

U. S. DEPARTMENT OF AGRICULTURE

FARMERS' BULLETIN No. 1245

FARMERS TELEPHONE COMPANIES

*Organization, Financing
and Management*



THE need for telephone service is as great in the country as in the city or village, perhaps even greater, because of the relative isolation of farm homes. Yet less than two-fifths of our country homes have telephones.

This bulletin aims to make available information that will assist in the extension of telephone service to rural districts now without it and in the improvement of existing rural service where improvement is needed. It deals with the general problems of organization, financing, and operation of rural telephone systems, touching only incidentally upon the technical and engineering problems of the subject.

Washington, D. C.

December, 1922

FARMERS' TELEPHONE COMPANIES: ORGANIZATION, FINANCING AND MANAGEMENT.

By I. M. SPASOFF and H. S. BEARDSLEY, *Junior Economists, Bureau of Agricultural Economics.*

CONTENTS.

	Page.		Page.
Development of telephone systems in rural districts.....	4	Cost of service.....	16
Methods of obtaining telephone service.....	7	Problems of operation and upkeep.....	18
Organization of a rural telephone company.....	8	Maintenance of lines.....	18
Kinds of telephone organizations.....	9	Location of switchboard.....	19
Incorporation.....	10	The automatic switchboard.....	20
Constitution and by-laws.....	11	Long distance connection.....	23
Types of rural telephone construction.....	11	Business administration.....	23
Preliminary estimate of cost.....	12	Appendix.....	25
Methods of raising funds.....	14	Constitution and by-laws.....	25
Completion of the organization.....	15	List of commissions having jurisdiction over telephone companies.....	29

There are 13,500,000 telephones in the United States, 2,500,000 of which are on farms. Figures of the 1920 Census of Agriculture show that 38.9 per cent of all farms, or approximately two farms out of five, have telephones. This ratio varies greatly according to locality. In Iowa, for instance, 5 farms in every 6 have telephones, while in South Carolina only 1 farm in 18 is so equipped. (Fig. 1.)

The problem of those who want telephone service will differ according to the relative development of the telephone business in their localities. Thus in the Corn Belt, as the accompanying map (fig. 1) shows, there is little need for the formation of new companies. In this section the country is already well covered. The farmers still without telephones will want to know how they may best connect with existing systems, and the chief concern of those who are managing established companies will be that of improvement rather than material extension. In the South Atlantic Division and in some of the Mountain States, on the other hand, very little has been done toward establishing rural service.

In the South, lack of telephone service is largely due to the nature of land tenure, a large proportion of the farms being operated by tenants on short-time contracts. Commercial companies hesitate to build lines with the prospect that after the construction is completed the subscribers may move and leave the lines idle. For the same reason, tenants do not often put in telephones, since they can not afford to build lines only to leave them. Few Southern landlords have felt enough need of telephone connection with their tenants to arouse any great interest on their part in the development of rural service.

The difficulties met with in the Western States are of a different nature. The rugged country and great distances are the chief causes for the lack of telephone service. In some localities farmers have

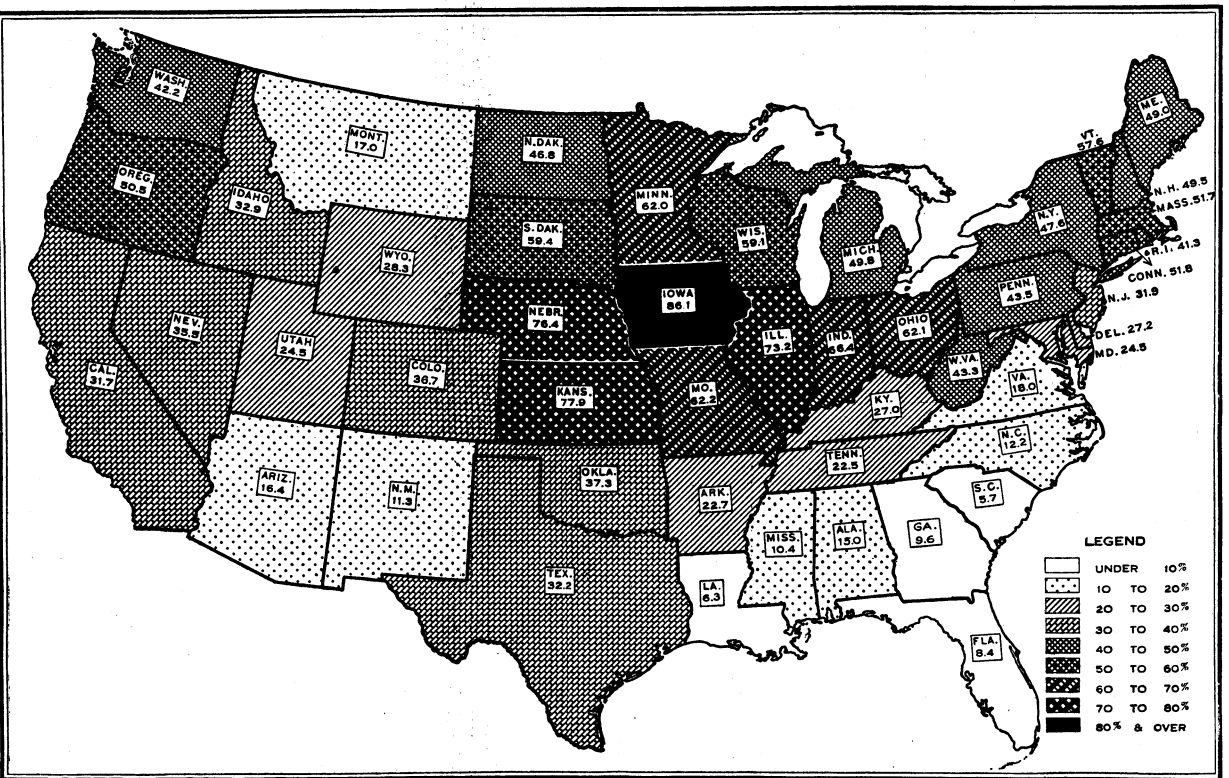


FIG. 1.—Percentage of farms having telephones.

overcome these handicaps by using barbed wire fences for lines. While such lines are not to be recommended, except in emergencies, they are better than nothing and may serve until they can be replaced by better construction.

DEVELOPMENT OF TELEPHONE SYSTEMS IN RURAL DISTRICTS.

Alexander Graham Bell entered his first patents on the telephone in 1875. Since then the development of the industry has been remarkable, in regard both to growth and improvement in service. At first telephone messages were considered as possible over short distances only, and the sending of a message from Boston to New York in 1884 was considered a great feat. Now people on the Atlantic coast may talk with friends on the Pacific coast, 3,000 miles away. By wireless telephone, Paris and New York have been brought within speaking distance.

From the late seventies, when the first commercial companies were organized, until the expiration of the first patents, the extension of telephone lines was confined chiefly to the larger cities. It was all the new industry could do to keep up with the ever-increasing demand in the business centers, and not until toward the end of the century was marked progress made in the establishment of small town and rural lines.

With the expiration of the second Bell patent, in 1894, a fever of competition arose among the independent promoters and the numerous manufacturing concerns that quickly came into existence. The fact that the larger cities had already been more or less thoroughly equipped made it necessary for the new companies to extend the telephone business into the unworked territory of the smaller towns and rural districts. Although the majority of the companies organized at this time were promoted honestly, there were some unscrupulous promoters who took advantage of public interest, and by poor equipment and dishonest methods, delayed rather than promoted the extension of rural telephone service in certain districts.

Stimulated by the competition from new companies which were everywhere springing up, the city companies also began to extend their lines into the country. In spite of these efforts there were still a great many sections which were not reached. The only way of getting service in such cases was the building of cooperative telephone systems which were locally owned and operated.

During the 10 years following 1896, great waste resulted from the building of two or more systems in territory that could support but one. Such duplication, often resulting from unfair charges on the part of the company first in the field, limited the number of telephone connections possible for any subscriber unless he had a telephone in each system. This unsatisfactory and often very annoying condition was one of the reasons that led to the supervision of telephone companies by State commissions and by the Interstate Commerce Commission.

By 1910, 18 States had placed telephone companies under the control of State commissions, and during that year the Interstate Commerce Commission was given control over telephone companies doing an interstate business. At the present time, telephone companies are subject to commission control with regard to rates, service, and other matters in all States, except Delaware, Iowa, and Texas. In

Iowa, however, the lines of telephone companies must cross railroads in a manner prescribed by the State railroad commission, and in Delaware and Texas there are specific sections of the law that regulate the building and operation of telephone lines. Among the benefits which have resulted from commission supervision or control of telephone companies are reasonable rates for service, and a tendency toward the elimination of unnecessary duplication.¹

Statistics concerning telephone companies in the United States were collected in connection with the censuses of 1880 and 1890, and a special census of the telephone industry has been taken every fifth year since 1902. The United States totals for the more important items have been compiled from the census reports and are presented in Table 1. There were 148 telephone systems in 1880, which operated 437 public exchanges, averaging 124 telephones each. In 1890, there were 53 systems, which operated 1,241 public exchanges, averaging 188 telephones each. Although there were fewer systems in 1890 than in 1880 there were more and larger exchanges in operation.

TABLE 1.—*Number of telephone systems, public exchanges, telephones, and miles of wire for different classes of companies—United States totals (census figures).*

Year and class.	Systems.	Public exchanges.	Telephones.	Miles of wire.
Unclassified:				
1880, all companies.....	148	437	54,319	34,305
1890, all companies.....	53	1,241	233,678	240,412
Classification, by type of company:				
1902—				
All companies.....	9,136	.....	2,371,044	4,900,451
Bell companies.....	44	3,753	1,317,178	3,387,924
Other commercial companies.....	3,113	5,666	908,803	1,391,647
Mutual companies.....	994	942	89,316	70,915
Farmer or rural companies ¹	4,985	.....	55,747	49,965
1907—				
All companies.....	22,971	.....	6,118,578	12,999,369
Bell companies.....	175	5,418	3,132,063	8,947,266
Other commercial companies.....	4,726	9,284	2,294,910	3,470,776
Mutual companies.....	368	825	125,956	95,033
Farmer or rural companies ¹	17,702	.....	565,649	486,294
Classification, by income:				
1912—				
All companies.....	32,233	.....	8,729,592	20,248,326
Bell companies.....	176	5,853	5,087,027	15,133,186
Other companies with \$5,000 or more.....	1,740	5,662	2,239,721	3,886,205
Companies with less than \$5,000.....	30,317	.....	1,402,844	1,228,935
1917—				
All companies.....	53,234	21,175	11,716,520	28,827,188
Bell companies.....	145	6,288	7,326,858	23,133,718
Other companies with \$5,000 or more.....	2,055	6,006	2,626,852	4,164,308
Companies with less than \$5,000.....	51,034	8,881	1,762,810	1,529,162

¹ Smaller companies with no regular exchanges or centrals of their own.

In the censuses of 1902 and 1907 telephone companies were classified as "commercial," "mutual," and "independent farmer" or "rural" lines, but in the census of 1912 this classification was changed to one based on annual income. The companies having an annual income of less than \$5,000 in 1912 and 1917 were, of course, not all farmer and rural lines, but by comparison with the figures for the two preceding periods it would seem that a large percentage of these smaller companies were of that class. In view of the fact that there are a considerable number of rural telephones on the lines of larger

¹ For a list of these commissions see page 29.

city companies, concerning which no definite information is available in the census, it is probable that telephones in rural districts numbered at least 2,000,000 in 1917.

Although the number of independent telephone companies, including both commercial and mutual lines, has more than doubled since 1907, the Bell system has grown even more rapidly. In 1907 the 22,796 companies outside the Bell system owned 48.8 per cent of the number of telephones in use, and the Bell companies 51.2 per cent. In 1912 the Bell system owned 58.3 per cent, and in 1917, 62.5 per cent of all the telephones in use in the United States. Moreover, an increasing percentage of independent companies are being connected with the Bell lines. These facts indicate a tendency toward cooperation, as well as consolidation among companies making possible telephone connection between almost all points in the United States.

METHODS OF OBTAINING TELEPHONE SERVICE.

The building of independent telephone systems is not desirable when there are already established companies in the locality unless such companies are unfair in their methods or unreasonable in their demands. A needless duplication of systems is always to be discouraged, and cooperation with existing companies for the extension of their lines and service is greatly to be desired. In most cases a local company will meet a group of prospective members or subscribers halfway on the question of the extension of service. The commercial companies usually have a definite program for the extension of their service to rural districts. Three principal methods of rendering service in rural areas are employed by such companies:

(1) An extension of the company's city line to a rural subscriber, furnishing him with complete city service. For this the subscriber pays regular city rates plus an additional charge based on the distance of his telephone from the city limits. To telephone men this charge is usually known as an "extra exchange line mileage charge."

(2) An extension of a line by the company beyond the city limits, in this case to connect a number of subscribers. Since all of these subscribers, generally 5 to 16 in number, must share the same line, the company offers a rate lower than that generally charged in the city proper, although it generally approximates the rate for four-party line service. Such rural subscribers are said to receive "rural-line service."

(3) The construction and maintenance of a company line to or near the city limits only. The telephone instruments and all further construction and maintenance are provided by individual farmers or by associations. This is known as "service-station service."

Agreements for service-station service generally require that the association or subscriber shall perform the following duties: Construct and maintain all pole lines and wires up to a predetermined point; provide and maintain the necessary telephone instruments and other equipment; pay, in accordance with the rules and regulations of the company, the regular rates as established for exchange and toll service; guarantee payment at the established rate for not less than a given average number of telephones for each line or for each mile of line; limit the number of telephones on any one line to a maximum number prescribed by the telephone company; pay its proportion of

the taxes and assessments of every kind and assume liability for all damages which may result from its line or the use thereof.

The company, on the other hand, agrees to perform the following duties: Provide and maintain a line connecting the service-station line to its central office; furnish to service-station patrons the same service given other subscribers;² assist the service-station subscriber or association with reasonable engineering advice and supervision in the building and maintenance of its lines; where facilities exist, lease circuits and attachment space on its pole lines at regular rates; list service-station subscribers in its local directories and furnish such subscribers with copies of each issue of the directory.

As a rule, the telephone company will not connect with service-station lines which, in its opinion, are not capable of giving good service.

The charge for extra exchange line mileage averages about 25 cents per station per quarter mile per month in addition to the regular city rates. Rural line residence rates for a large class of commercial companies vary from \$1 to \$3 per month, the average being about \$2. Service-station residence rates are much lower, inasmuch as the only expense assumed by the company is that of switching and of maintaining a relatively short line. With few exceptions, the rates under this plan vary from 25 to 75 cents per month per telephone, the average charge being about 50 cents per month.

It occasionally happens that a local independent company furnishes free switching service to a small organization that maintains no switchboard. The explanation of this seems to be that access to the telephones of the local company or association receiving the free service is considered of material value to the switching company and to its subscribers. The methods of mutual and independent companies as a rule, however, are similar to those of commercial companies: In most cases they make a fixed charge for each telephone receiving exchange service, and in some a flat yearly charge is made covering switching done for all the members of an association.

Contracts regarding exchange of service between two companies when each maintains its own switchboard are of a different nature. (See p. 23.)

ORGANIZATION OF A RURAL TELEPHONE COMPANY.

If no satisfactory rural line service is available in a given locality, the only means of securing telephone service for a group of individuals is through the organization of a local company. The United States Department of Agriculture recently made a study of more than 450 companies of this type, and the following suggestions as to organization and operation are based on the experience of these existing systems.

A company may be organized either as a local unit for obtaining service-station service from some larger local company or as an independent operating company which maintains its own switchboard. In the former case care must be taken to comply with the rules of the company from which it is proposed to secure switching

² When service-station telephones are connected with toll stations local service is usually restricted to communication with the toll station and to other service stations connected with the toll station, and toll rates to all other points are the same as those applying from the toll stations.

service, while in the latter the organizers are freer to work out their own ideas.

As the first step toward organizing a company it is necessary to get the cooperation of a number of leaders in the community. Before anything is done to arouse general interest in the undertaking this group should determine the kind of organization to be formed and the general type of system which is best suited to local conditions. They should also make at least a preliminary estimate of the cost and be ready to suggest plans for raising funds.

KINDS OF TELEPHONE ORGANIZATIONS.

There are two general types of business organization, the commercial or profit-seeking company and the mutual or cooperative association. Both types are found among rural telephone companies. The commercial company may be either a private enterprise or a stock company, while the mutual association may be either a pure mutual or stock mutual.

The privately owned rural telephone system frequently belongs to a single individual who owns a switchboard or central exchange and furnishes switching service to a number of local rural lines. In other cases, such systems may include the exchanges of several towns.

The commercial stock company may have few or many stockholders. Where the stockholders and subscribers are not the same individuals, the company is looked upon the same as any other public-service corporation by its subscribers and the public. On the other hand, if a majority of the subscribers are stockholders, it may closely resemble a stock mutual, even in regard to management and control.

The pure mutual organization is operated solely for the convenience of its members. All members share in the management, either directly or through their representatives, and each bears his prorata share of the expenses of the enterprise. As a rule, each member owns his telephone and equipment, no fixed charges for service are made, and the necessary assessments are reduced to a minimum through cooperation, each member keeping in repair his own instrument and a portion of the line.

The pure mutual type of company is well adapted to the operation of small country systems consisting of one, or at most of only a few lines, more especially when no switchboard is maintained. If such a company consists of more than a single line, switching service is usually obtained from a neighboring company.

The stock mutual differs from the pure mutual type in several respects. Instead of prorating the costs among its members, the stock mutual, as its name implies, issues shares of stock, which are sold to those desiring telephone service. Ordinarily, only one share of stock is sold to a member, but this practice is by no means universal. Sometimes the voting privilege of members is determined by the number of shares of stock held, each share carrying one vote, but more commonly each member is allowed only one vote, regardless of stock held. The stock mutuals often have subscribers who are not members, and in most cases a regular yearly charge is made for service to all subscribers, the charge to nonmembers being somewhat higher, as a

rule, than that to members. Dividends are seldom paid on the stock of such companies, the shares being in most cases little more than certificates of membership. The shares may not be transferred without the approval of the company, and must usually be surrendered at par upon the withdrawal of a member or the discontinuance of the service. In other respects, the stock mutual is not unlike the pure mutual, having the cooperative plan of organization and management.

The private concern and stock company for rural service are usually centered in a town of small or medium size, with lines branching out into the surrounding country, and the pure mutual is often found on short lines in more or less isolated districts. The stock mutual seems to be the most common. Out of a group of 252 rural telephone companies studied, 3 per cent are private concerns, 15 per cent stock companies, 27 per cent pure mutuals, and 55 per cent stock mutuals.

INCORPORATION.

There are many points in favor of incorporation, particularly for larger mutuals. Although such action may seem to involve more formality than necessary for the simple organization of a local association, an incorporated company is governed by specific laws which are a direct benefit to the company. The incorporated company enjoys certain rights which can not be exercised by the unincorporated company. In some States incorporation gives the company the privilege of taking necessary land for right of way and other purposes at an appraised value, by what is known as the right of eminent domain, while in other States this right may be obtained upon petition to the State commission having supervision over such companies.

Moreover, the members of an incorporated company are protected by having a limited liability, while the liability of the members of an unincorporated company is unlimited. Of 33 companies in a certain locality from which reports on this point were received, 20 were incorporated. All but one of the incorporated and five of the unincorporated companies recommended incorporation.

Advantages of incorporation are well illustrated by the following examples. In the case of one company, a pole fell and killed a horse. The company was incorporated and its members were liable only to the extent of the par value of their stock, the loss being distributed in proportion to the shares held by each member. In another case, fallen wires across a road wrecked an automobile and injured the occupants. A damage suit was brought. This company was not incorporated and a few telephone owners on the line were held for all damages.

On the other hand, incorporation places the company under the supervision or control of some State commission or board, and makes necessary more careful bookkeeping and the submission of certain reports to State officials.

In the case of a small local company it might not seem advisable to incorporate, more especially if the company is not to be operated for profit.

If it is decided to incorporate, the State law should be consulted, as the form for the articles of incorporation is usually prescribed by

law. Unless the State commission can be relied upon for legal assistance, it is well to secure the advice of a competent lawyer with regard to the requirements. Thus delay and possible financial loss may be avoided.

CONSTITUTION AND BY-LAWS.

Although mutual organizations which are not conducted for profit are seldom required to have a legal charter or to incorporate it is wise for all concerned to have a written agreement in the form of a constitution and by-laws. Suggested forms for such agreement will be found on page 25. Alternate sections, applicable to the pure mutual or to the stock mutual type of organization, are given. In using this form for a pure mutual company, all sections which are inclosed in parentheses should be omitted. Thus, Article I, section 1, of the by-laws would read: "Each member shall pay into the treasury of the company a membership fee of \$3 for each telephone," etc. For the use of a stock mutual organization, all sections printed in italics should be omitted and sections in parentheses included. In this case the section quoted would read: "Each member shall buy one share of stock in the company, for each telephone," etc. If these by-laws seem too elaborate, or if certain sections are not required for the purpose of the company, only the sections which are applicable need be used. If the members of a short line are organized very informally, it is possible that the only rules they will require are contained in the article on "Rules for service and the use of lines," while a somewhat larger organization in which the members construct and maintain their own lines might omit the parts relating to the board of directors and change the other articles to fit their needs.

TYPES OF RURAL TELEPHONE CONSTRUCTION.

There are two general types of telephone construction which may be used in rural districts, the grounded or one-wire system and the metallic or two-wire system.

For short lines the grounded system may be used to advantage. This type of system is cheaper to build than the metallic, since only one wire is needed, the ground being used to complete the circuit. Of the grounded systems for which reports are available, 44 per cent state that the grounded lines are satisfactory. There are many conditions, however, which tend to interfere with good service on grounded lines. These lines are frequently subject to buzzing noises which can not be eliminated. In very dry weather when there is little moisture in the ground, the ringing will be weak and the talking faint over a grounded line. In very cold weather, also, when the earth is frozen, the grounded telephone line will not give good service unless the ground connection is well below the frost. Where electric light circuits or trolley lines are too near the telephone line, it is almost impossible to use a grounded system.

The metallic system, in which two wires are used to make the complete circuit, is free from these particular defects, although when near electrical circuits and power lines such systems must also be protected from interference by a special arrangement of the two wires. A somewhat stronger pole line and twice the length of wire

are required, but in other respects the equipment is practically the same as for the grounded system.

In a grounded system the magneto, or local battery type of telephone, is the only one that can be used. But in a metallic system there is a choice between the magneto and the central battery type. A variation of the central battery type is found in the automatic system, which is discussed on a later page. The magneto type of telephone is usually found on rural lines, while the central battery system is better for city service where a permanently located exchange is maintained.

PRELIMINARY ESTIMATE OF COST.

Chief among the causes which have encouraged the organization of local rural telephone companies has been the desire to obtain service at low cost. While the matter of low cost is highly important if telephone service is to be placed within the reach of all, the question of efficiency in service must not be overlooked. Poor service is unsatisfactory at any price, for telephone service to be of real value must be available when it is needed. Moreover, actual financial loss may result from the purchase of instruments and the building of lines which are either defective in themselves or unsuitable for the uses to which they are to be put. On the other hand, it is poor economy to provide an expensive and complicated system if a simpler one which costs less will answer the purpose fully as well. In the long run, the most economical system is the one that gives satisfactory service with the least demand for repairs and replacement, rather than the one that has the lowest original cost.

A study of the original costs of 252 companies, which averaged 73 members each, shows that the average cost for all these companies was \$2,110. In other words, the original cost per member was about \$29. Almost 50 per cent of the companies reporting had an original cost per member of \$25 or less. In only 12 per cent of the companies was the cost \$50 or more, while in 2 per cent the cost was more than \$100 per member. These figures apply to systems constructed before war-time prices went into effect, and the average cost is doubtless lower than companies can hope for at present in spite of the recent decline in prices of materials and equipment.

The material needed for each mile of line, aside from poles, is given below, together with the approximate cost for each type of construction based on price lists issued by a number of manufacturers early in 1922.

Grounded line, bracket construction:

30 12-inch oak brackets.	30 40-penny wire nails.
30 pony glass insulators.	30 60-penny wire nails.
165 pounds No. 12 BB galvanized-iron telephone wire.	
Approximate cost, \$16.50.	

Metallic line, bracket construction:

60 12-inch oak brackets.	60 40-penny wire nails.
60 pony glass insulators.	60 60-penny wire nails.
330 pounds No. 12 BB galvanized iron telephone wire.	
Approximate cost, \$33.	

Grounded line, six-pin cross-arm construction:

30 6-pin cross arms.	30 machine bolts.
180 1½-inch locust pins.	60 carriage bolts.
30 pony glass insulators.	30 lag screws.
60 cross-arm braces.	30 square washers.
165 pounds No. 12 BB galvanized-iron telephone wire.	30 round washers.

Approximate cost, \$53.

Metallic line, six-pin cross-arm construction:

30 6-pin cross arms.	30 machine bolts.
180 1½-inch locust pins.	60 carriage bolts.
60 pony glass insulators.	30 lag screws.
60 cross-arm braces.	30 square washers.
330 pounds No. 12 BB galvanized-iron telephone wire.	30 round washers.

Approximate cost, \$68.

If there are four subscribers for each mile of line, each member will of course have to bear one-fourth of the above-mentioned cost per mile.

The material needed for installing each telephone and the approximate cost is as follows:

2 batteries.	4 porcelain knobs.
1 lightning arrester.	4 3-inch iron screws.
15 feet single wire.	2 8-inch porcelain tubes.
20 feet paired wire.	12 ½-inch insulated staples.
6 2-inch screws.	1 6-foot iron ground rod.
1 bridging wall telephone, 5-bar, 1,600-ohm.	

Approximate cost, \$19.

These figures indicate that the cost per member, exclusive of the cost of poles and switchboard, where bracket construction is used, will be about \$23 on a grounded line and \$27 on a metallic line. In case of cross-arm construction it will be about \$32 for members on grounded lines and \$36 for those using metallic circuits.

Those rural companies which plan to operate switchboards will find the approximate cost of boards of various sizes in the following list:

5-line ringer board, about.....	\$55
10 to 15 drop wall board, about.....	100
30 drop wall board, about.....	250
40 drop wall board, about.....	350
50 drop cabinet board, about.....	400
75 drop cabinet board, about.....	500
100 drop cabinet board, about.....	600
150 drop cabinet board, about.....	800
200 drop cabinet board, about.....	1,100

To the above costs per member comprising one-fourth of the cost of a mile of line plus the cost of installing a local telephone plus the cost of a part of the switchboard, if there be one, must be added the cost of the poles, unless these can be furnished by members without cash outlay. For a well-constructed line 30 substantial poles per mile are needed. A grounded line with a single wire may, however, be constructed with fewer poles if it is certain that additional wires will not be needed. While smaller poles are often used by farmers' mutual companies, experts recommend a pole 6 inches in diameter at the top and about 25 feet in length. Where such

poles have to be bought from a distant market the cost per member is likely to equal or exceed the cost per member for all the other material.

In selecting poles even greater care should be used than in selecting timber for high-grade fence posts. Short lived or weak poles represent false economy, because the cost of replacing them almost invariably more than offsets the original saving in cost. In addition to this, there is the danger of damage to property or persons.

The above estimates are based on the assumption that there will be only one circuit on the poles. When the same pole line is to carry more than one circuit the cost of the additional equipment must be added. Moreover, no allowance has been made for the cost of labor, on the assumption that in the majority of cases the members themselves construct the line.

Mutual companies sometimes require each member to build a certain portion of the line and to buy and connect his telephone. This method is not a real financial saving, as is that of furnishing poles and labor, for each individual is obliged to pay out a certain amount of cash to fulfill his obligation to the company. It will be found more economical to have all matters pertaining to the purchase of equipment handled by one individual or by a purchasing committee. Through the purchase of larger quantities a better price may be obtained from the manufacturer. Furthermore, the advantage of securing equipment of uniform quality is of considerable importance, since it is generally admitted that a system gives better service if all the instruments are of the same kind. Of the mutual lines of which the Department of Agriculture has record only 10 per cent had a portion of the lines constructed by each member, while 90 per cent collected the cost of the equipment in cash and built the line as a company enterprise.

Before attempting to make an exact estimate of the cost of a proposed telephone system it would be advisable to get the catalogues of a number of manufacturers of telephone equipment and supplies, a list of whom may be secured by writing to the Department of Agriculture at Washington, D. C. After a careful comparison of equipment of the type decided upon, offered by the several companies, a letter setting forth the details of the proposed system should be addressed to the company selected. Care should be taken to present all points which would in any way affect the system, such as the general lay of the land, nature of the soil, distances to be covered, presence of electrical circuits, probable number of subscribers, and the greatest extension of the system that may be hoped for in the future. If suitable poles can be obtained locally this should also be mentioned. Manufacturers are glad to give prospective customers the benefit of advice from their expert engineers in making estimates of requirements and cost.

METHODS OF RAISING FUNDS.

There are four general methods of raising funds for the construction of a telephone system, namely, by sale of stock, by voluntary subscription, by fixed or pro rata assessment, or by borrowing. In companies where the ownership of stock is made the basis of membership, the price of shares is usually fixed at an amount which is expected to

insure sufficient funds. In case, however, that not enough shares are sold, or the price has been made too low, an additional assessment is usually made against the stock. In some stock mutuals members are originally assessed pro rata and the amount so assessed is taken as the value of one share of stock. In pure mutual companies funds may be raised by voluntary subscription or the members may be assessed pro rata for their proportion of the cost.

Borrowing may be resorted to in the case of any company that finds funds available. Sometimes a leading business man or the local bank will advance funds for the construction of a telephone system which is almost certain to work for the general benefit of business more than for that of any one individual. Only about 1 per cent of the companies reporting, however, resorted to borrowing as a means of raising funds for construction.

Among the stock mutual companies reporting, 81 per cent raised funds entirely through the sale of stock, 4 per cent by sale of stock and assessment, and 15 per cent by assessment. Among the pure mutual companies, 69 per cent raised funds by fixed assessments and 31 per cent by voluntary subscriptions. The companies that reported borrowing money for construction were either private concerns or stock companies, and only 6 per cent of the latter used this method, the remainder raising funds by the sale of stock.

As a rule it will be found better to raise the funds among the members. The particular method of deciding each member's share is not of very great importance. The main thing is to raise enough funds in a single subscription to insure success for the undertaking. It is undoubtedly easier to secure a slightly larger payment in the first place than it is to collect additional funds from members who thought that they were paying all that would be required in the beginning.

COMPLETION OF THE ORGANIZATION.

When all important matters relating to the proposed organization have been agreed upon by the leaders in the enterprise, and it is desired to interest the whole community, a public meeting should be called. At this meeting the best speaker available should present the subject. He should have clearly in mind the advantages which such a system would bring to the business and social life of the community. He should also have approximate figures of the cost of the system, and an outline of the form of organization.

At the close of this meeting a temporary organization should be effected by the election of temporary officers and the appointment of a membership committee and a committee on constitution and by-laws. If the proposition seems to have met with general approval, it may be proper to take subscriptions for membership or stock before adjournment. Much travel and canvassing can, of course, be saved if subscriptions can be secured at this meeting. If, however, little interest has been shown, it would probably prove unwise to push matters too fast. Many an organization is spoiled by a failure to use reasonable tact.

Assuming that enough subscriptions have not yet been secured, it should be the duty of the membership committee to see that the territory is thoroughly canvassed. They may divide the territory among themselves and cover it individually, or, if the farms are too

widely scattered, they may secure the cooperation of those already pledged and have them take up the matter with their friends and neighbors. All possible publicity should be given the matter, and the period of solicitation under no circumstances should be long enough to allow the original interest to die out in the meantime. The campaign for members should be as short and as lively as possible.

When enough members have been secured to make the undertaking a financial success, the first regular meeting of the company should be called by the temporary chairman. At this meeting the formal organization should be completed through the adoption of a constitution and by-laws and the election of directors, after which the next step is to proceed with the construction and operation of the system.

COST OF SERVICE.

The important factors which have been found to affect the cost of service on lines for which information is available are the size of the system, the extent of its territory, the type of construction, the quality of service demanded, and the efficiency of management.

In the telephone industry, the cost per subscriber increases as the number of subscribers in a system increases. As the system becomes larger, more complex equipment is needed, increasing the company's investment per subscriber. Furthermore, with an increased number of connections more calls per telephone tend to be made. Thus the cost of unlimited service in the larger cities becomes almost prohibitive. In such places the general practice is to allow each subscriber a certain number of calls each month with an extra charge for each call in excess of that number.

The average annual service charges of 250 rural companies, as presented in Table 2, clearly illustrate the tendency for costs to increase with the size of the company.

TABLE 2.—Average annual charges for service per telephone for different types of companies, by size groups.

Size groups.	All types of companies. ¹	Joint-stock companies.	Stock mutual companies.	Pure mutual companies.
Not operating switchboard.....	\$11.57	\$18.34	\$10.10	\$9.38
Operating switchboard:				
Systems of 1 to 50 lines.....	10.17	13.71	10.42	7.48
Systems of 51 to 100 lines.....	11.26	14.18	11.17	7.09
Systems of 101 to 200 lines.....	12.34	15.87	13.33	4.72
Systems of more than 200 lines.....	16.22	16.53	15.40	.....
All systems.....	12.64	16.00	11.70	7.26

¹ There were not enough figures for privately owned companies to warrant the making of averages for this class.

Nearly all companies without switchboards have fewer than 50 lines. A comparison of their cost with the cost of companies of the same size operating switchboards appears to indicate that it is cheaper for a small company to operate its own switchboard than it is to obtain switching service from another company. It is probable,

however, that these averages, particularly in the case of pure mutuals, represent current cost of operation only, and do not make due allowance for the expense of installing a switchboard of the required capacity. Therefore, although the reported cost of operation for companies which maintain their own switchboards is lower, it might still prove more costly for some companies to do their own switching when all the expenses involved are taken into account.

For pure mutuals, the annual service charge for telephones is relatively low, and unlike that for other companies decreases as the size of the company increases. This is due chiefly to the fact that in such companies members usually repair the lines and give other services to the company without charge. The only items of cost considered are those where cash is spent, and usually include merely the wages paid the operator and once in a great while the purchase of new equipment. Since the one operator required for 50 subscribers will usually handle up to 200 with little extra pay, the expense for each subscriber is naturally less when the number sharing the expense is larger.

The fact that the hire of the operator is the chief expense for mutual companies is clearly shown in Table 3, three-fifths to three-fourths of all money collected being spent for this purpose, while in the case of other companies less than two-fifths is so used. It may also be noted that the proportion of the total service income of pure mutuals spent for switching charge increases with the size of the company.

TABLE 3.—*Percentage of annual charges for service used to pay the cost of switching service for different types of companies, by size groups.*

Size groups.	All types of companies.	Joint stock companies.	Stock mutual companies.	Pure mutual companies.
Not operating switchboard.....	58.2	64.2	54.0	60.0
Operating switchboard:				
Systems of 1 to 50 lines.....	48.9	43.8	45.8	65.5
Systems of 51 to 100 lines.....	44.9	38.4	44.6	70.6
Systems of 101 to 200 lines.....	30.5	23.0	29.2	75.5
Systems more than 200 lines.....	29.1	28.8	30.0	.....
All systems.....	38.8	32.2	40.7	66.1

With other than pure mutual companies, on the other hand, a smaller and smaller percentage of the income from service is used to pay switching charges until companies of more than 200 subscribers are reached. This means that a larger and larger part of the income is spent on the upkeep or improvement of the system, or a greater amount is paid out in salaries or dividends. The increase in the percentage of income used for operating expenses in companies of over 200 lines occurs because a single operator can not conveniently handle the calls on a switchboard of greater than 200-drop capacity, and the employment of additional operators becomes necessary.

Another factor which may require the spending of a larger percentage of income for repairs as companies increase in size, is that the

larger companies are usually the older ones, and on account of their age are more in need of repairs and replacement than the companies recently organized.

As would be expected, systems operating over a large territory have higher costs of operation and maintenance than systems in which all subscribers live within a smaller area. The best measure of the area covered by a given system is the number of miles of pole line in use (Table 4).

TABLE 4.—*Annual cost of service per telephone as affected by number of miles of pole line in system.*

(Average for 197 existing companies.)

Miles of pole line.	Average annual cost.	Miles of pole line.	Average annual cost.
20 miles or less	\$9.45	61 to 80 miles.....	\$11.31
21 to 40 miles.....	10.87	81 to 100 miles.....	12.59
41 to 60 miles.....	10.36	More than 100 miles.....	12.84

The two types of telephone construction have already been discussed, namely, the metallic, in which the entire circuit is carried by wires, and the grounded, in which the return is through the ground. Metallic systems, by their very nature, are the more expensive to maintain. An average for 200 companies showed a yearly cost of \$12.27 per telephone for metallic and \$11.06 per telephone for grounded systems. But with their increased cost, metallic lines usually give proportionally better service. One important point should be kept in mind in this connection. When kept in repair metallic systems are the best, but they must be kept in repair. A poor metallic line is worse than a poor grounded line, as the ground will give better contact than a poorly-spliced rusty wire.

Quality of service is difficult to measure. The cost of service for existing mutual companies reporting their lines in good condition was found to be \$11.36 per telephone per year as against \$10.46 for those reporting lines in poor condition. This plainly shows that members of mutual lines must expect to pay a somewhat higher rate if they wish to keep their service up to the desired standard.

PROBLEMS OF OPERATION AND UPKEEP.

The general operation of a telephone company may be roughly divided into three parts: (1) The maintenance of the lines, (2) the switching and information service, and (3) the business administration, including bookkeeping and collections.

MAINTENANCE OF LINES.

Line maintenance may be handled in one or two ways (or variations or combinations of these ways), namely, by the employment of a regular lineman or by having repairs made by the subscriber. A majority of mutual companies use the subscriber plan, although many of them do not find this method satisfactory. The choice of method should depend upon local conditions.

Expert repairing undoubtedly keeps a telephone system in better condition, not only because work is done more thoroughly, but also because a regular lineman can do a great deal in the way of trouble prevention. On the other hand, it costs more to employ a regular lineman. Companies operating in sparsely settled regions find the cost of getting a repair man to the scene of trouble three or four times the actual cost of the repair work. Again, in very small companies, the share of expense falling on each member makes the cost of hiring an expert prohibitive.

Certain companies avoid some of the difficulties of nonexpert repairing by having one subscriber responsible for each line in the system. The subscriber who handles the work is usually given a reduction in his telephone rent or the free use of his telephone as compensation. This plan does effect a saving and at the same time centralizes responsibility, although it does not necessarily assure expert repairs. In other cases, a member of a mutual company who has had telephone-repair experience agrees to report for duty on any line when needed, receiving pay by the hour for actual time spent. This plan has usually proved satisfactory, although subscribers may find themselves without service for a few days if their line happens to be out of order while the repair man is doing rush work, such as harvesting.

Those mutuals which connect with larger commercial companies are often able to get help from the commercial concern when they need it, usually being charged the actual cost of the operation plus a small percentage for supervision. Minor repairs are then made by the subscribers.

In general, expert work has been found preferable where its cost has not been too great.

LOCATION OF SWITCHBOARD.

Rural line switchboards may be found in private homes, stores, rented offices, or in separate buildings owned or rented by the companies.

Private home installation is confined almost exclusively to the smaller companies which can not afford to rent or build separate offices. The owner of the house is paid a small rent and some member of his family is usually made operator, and paid for this service. The advantages of such a system are evident. The rent for switchboard space is usually small, in many cases amounting only to a rebate of telephone rent to the house owner. Operator hire is also low, since the women of the house can do their regular housework and at the same time make the switching connections. Moreover, in case of emergency a night call will always receive attention.

Occasionally the switchboard is placed in a member's store instead of a private home. Some one must be on duty all day in a store and the switchboard can be looked after without requiring a special operator. Night calls, on the other hand, can not receive attention if the switchboard is in a store, unless special arrangement is made.

Either of the above plans is more suitable to a small system than to one so large that calls are so numerous as to require the hiring of a regular operator. When an operator is required on full time most companies will do well to rent a separate room or building. Many

good reasons for this have been reported. Where the board is kept in the operator's home, a change of operators makes it necessary to move the board with all of its connections. The directors are also better able to control and regulate the operation of the switchboard in the company's own offices than they are when it is in the home of the operator. In a separate office the matter of night calls is not so easily handled. Either subscribers must be without service at night or someone must be assigned to regular night duty in the exchange.

A number of mutuals have solved these problems by building their central exchange buildings and making them large enough to include living quarters for the operators. Thus instead of moving the board to the home of the operator they move the operator to the board. An added advantage of this plan lies in the fact that the rent of living quarters is considered part of the operator's pay and thus, since the cost to the company is little more than it would be if only an office were rented, the cash outlay is somewhat lessened. All companies reporting this plan have found it satisfactory.

Some companies do business without owning switchboards. They either operate isolated lines or obtain their switching service from other sources. The single isolated line, where there are not too many members, needs no switchboard, since all telephones are on the same line and calls are made merely by the use of different rings. But this, of course, will not take care of long-distance calls.

Other cases are found in which large companies furnish switching service to independent lines on the service station plan, already mentioned, or in which merchants in small towns operate switchboards for the use of their patrons on country lines. Sometimes a family will operate a board for several independent lines and receive either a fixed monthly compensation or a small fee for each connection made between companies. In such cases members call others on their own line without the help of the board operator.

THE AUTOMATIC SWITCHBOARD.

Automatic service, or mechanical switching as it is often called, has recently been receiving considerable attention. Some advocate its use for small rural exchanges. A few such exchanges are now in operation and are apparently giving entire satisfaction, but the plan must be considered as still in its experimental stage.

The operation of the automatic telephone may be easily understood from an examination of the accompanying illustrations (Figs. 2 and 3.)

The dials which may be noted on the stand of the desk telephone and just under the transmitter of the wall telephone are used to call whatever number may be desired. For example, a person wishing to call No. 36 first takes down the receiver, then inserts his finger in the opening over number 3 and pulls the dial in a clockwise direction until his finger reaches the stop near the base of the dial. He then releases the dial which returns to its normal position by means of a spring. Next he "dials" No. 6 in the same way. He then pushes the button at the center of the wall box or on the front of the desk telephone base, as the case may be. This rings the bell at station 36 without the intervention of an operator. In case no one answers, the person ringing may again push the button. On some automatics a mechan-

ical arrangement takes care of this feature, continuing to ring at regular intervals until an answer is received or until the person making the call hangs up his receiver, which clears the line in all cases.

The plan of calling different subscribers by a series of long and short rings is known as code ringing. There are two methods of code ringing. In one, the person calling pushes the button the desired number of times; in the other the ringing is automatic, the

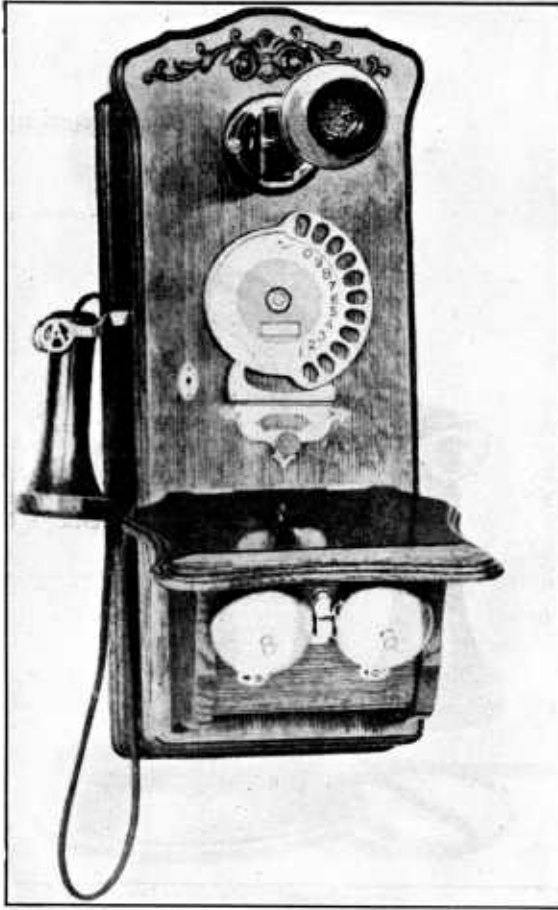


FIG 2.—Type of automatic telephone generally used on rural lines.

code being "dialed" in the same manner as explained above for "dialing" the number. For example, a person wishing to call No. 36, two rings, would "dial" 3-6-2. The ringers for all telephones on line 36 would automatically ring twice.

Such systems are not suitable for all conditions. In an isolated community, where connection with a hand-operated switchboard is not possible, 300 subscribers is usually the smallest number for which automatic service can be wisely considered. In such cases, an oper-

ator will be required for long-distance calls and therefore the automatic would not effect a saving, but would cost much more than a simple, hand-operated system. The equipment is more expensive and complicated than that needed for the regular magneto system, and requires expert attention, and the lines must be completely metallic and kept in perfect condition.

If the business of the line is such that two or more operators would be required for a hand-operated exchange, the automatic exchange



FIG. 3.—Detail of automatic telephones.

makes it possible to do without some of them. The most satisfactory arrangement is one in which the local exchange is near enough to a larger central office to make direct connection possible. Here no operator is needed for the local exchange, all long-distance calls being handled at the larger central office, which is reached by ringing a special number. By such a plan, 24-hour service is possible without the necessity of hiring a special night operator, and at the same time the service is generally improved. On the whole, however, the automatic equipment is so complicated that it is usually better adapted

to the use of commercial concerns than to installation and operation by farmers' mutuels.

LONG DISTANCE CONNECTION.

Having established its central office, a mutual company will next be interested in getting long-distance service for its members. Interchange between farmers' companies within short distances is often on a mutual free basis, members of each company being glad of the opportunity for connection with members of the other. If the farmers' company is close to a town where a commercial concern operates, the town company often gives the farmers connections with its subscribers on what is called a switching fee basis. The farmers' line pays either a certain amount for each subscriber or a yearly lump sum for the entire membership in return for the privileges of such connections. This plan is much like "service-station service" already discussed.

For long-distance toll calls, connection with the large independent companies or the Bell system is required, either directly or through the switchboard of another small company. Generally when the toll fee is paid, a certain percentage, depending upon the amount of the fee, goes to the company on whose lines the call originates. The remainder is generally prorated on the basis of the mileage involved. Thus a company owning half of the wire over which a toll message is carried is allowed half of the toll fee, after the originating charge is deducted. A company owning all the wire would get the entire fee, with the exception of the originating charge.

Lines having long-distance connections require more care than those used only for local calls. Many commercial companies refuse to connect with grounded lines, but the usual requirement is that the line must be in such condition as to carry messages clearly.

BUSINESS ADMINISTRATION.

The management of a small mutual telephone company is a comparatively simple matter. Frequently, the levying of rates and the making of assessments is left to the decision of the members at their regular meetings, the chief duty of the management in this connection being the keeping of accounts and making collections. If interstate business is handled and the annual revenue is more than \$5,000, the system of accounts prescribed by the Interstate Commerce Commission must be used. As has already been pointed out, further supervision of telephone lines is exercised in most States by State commissions, which, in many instances, prescribe accounting forms.

Collections are sometimes troublesome. Members may neglect their bills unless some inducement for prompt payment is offered. A small discount for payment in advance will encourage promptness. Most companies provide that subscribers more than 30 days in arrears shall have service discontinued. Assessments should not be too frequent. Mutuels will usually find payment in advance, once, or at most four times, each year, most satisfactory. The practice of sending monthly bills for small amounts not only annoys the subscriber but involves needless labor and expense.

Under most conditions, the publication of a telephone directory will be advantageous. Often advertising companies print directories

without charge, getting their money by the sale of advertising space in the book. In addition to the directory proper, the book may contain the by-laws of the company, a set of rules for the use of the telephone, or instructions for making simple repairs in case of local trouble. These repair hints often help subscribers to make timely repairs without undue tinkering. Thus they may save trips for the trouble man and at the same time, by telling subscribers what not to try, may prevent their getting things into still worse shape.

Requests for information and advice in regard to special problems confronting those who wish to make use of the suggestions contained in this bulletin, will be given careful attention by the United States Department of Agriculture. The department is anxious to encourage and assist in the extension of suitable telephone service to all farmers. The rural telephone has fully proved its value both for social and business purposes, and there is no sound reason why this convenience should longer be denied to more than half of those living in country homes.

APPENDIX.

CONSTITUTION AND BY-LAWS.

The following constitution and by-laws were prepared after a study of the methods and practices of a large number of successful mutual telephone companies throughout the country. In using these forms it must be remembered that it is impossible to suggest a set of rules which meet all requirements in all States, and that changes may be found necessary in order to comply with State laws or local conditions. Even where such is the case, these rules or forms should be found helpful.

Where incorporation is decided upon the State law must, of course, be carefully consulted and all requirements met. The form here given under the title of "Constitution" may in such case be used as the basis for "Articles of Incorporation."

In adapting the following constitution and by-laws to the use of pure mutual companies, all words or sections in parenthesis should be omitted, while for the use of stock mutuals, sections or words printed in italics should be omitted and those in parenthesis included. Sections which are inapplicable to the form of organization desired may, of course, be omitted at the discretion of the organizers. For a more complete discussion of organization agreements see page 9 of this bulletin.

CONSTITUTION OF THE ——— TELEPHONE CO.¹

We, the undersigned citizens of the United States and of the State of ———, hereby associate ourselves as members of a mutual telephone company, and for this purpose adopt the following constitution:

ARTICLE I. This company shall be known as the ——— Telephone Co.

ART. II. The principal office of this company shall be located in ———.

ART. III. The capital stock of this company shall consist of ——— shares at \$—— per share, and shall be increased only with the approval of two-thirds of the members at an annual or special meeting.

ART. IV. The business of this company shall be to provide telephone service for its members, by constructing, maintaining, and operating a suitable telephone system and to make connection with other companies for long-distance service for the convenience of its members, distributing among said members, equitably, as shall be provided in the by-laws, such costs and expenses as may be properly incurred.

ART. V. The territory of this company shall include ———.

ART. VI. Membership in this company shall be limited to persons who (buy stock therein, and) receive telephone service therefrom, as shall be provided in the by-laws.

ART. VII. The management of this company shall be vested in a board of nine directors, who shall be elected for such term and in such manner as the by-laws shall provide.

ART. VIII. Until the first annual meeting of the members, the following persons shall act as a board of directors:

Name.	Address.
.....
.....
.....
.....
.....
.....
.....
.....
.....

¹ Or "Articles of Incorporation."

ART. IX. The duration of this company shall be ——— years.

ART. X. This constitution may be amended by a two-thirds vote of the members present at any annual meeting, or any regularly called special meeting, a quorum being present, at least 30 days' notice of such proposed amendment having been given each member, in writing.

Signature of original members:

.....
.....
.....
.....

BY-LAWS

OF THE ——— TELEPHONE CO.

ARTICLE I.—MEMBERSHIP AND MEETINGS.

SECTION 1. MEMBERSHIP.—Each member shall *pay into the treasury of the company a membership fee of \$———* (buy one share of the stock in the company), for each telephone which he has or intends to have connected with its lines or exchanges, or shall furnish the equivalent of that amount in poles, wire, apparatus, or labor, said equivalent to be determined by the board of directors, and shall be required to sign the by-laws of the company.

SEC. 2. NUMBER OF TELEPHONES.—A member shall be entitled to have under the provisions of the preceding section one telephone in each house, store, office, or other building owned, leased or occupied by him or by the members of his immediate family.

SEC. 3. ANNUAL MEETING.—The annual meetings of the members of the ——— Telephone Co. shall be held in ———, on the first Monday after the first Tuesday of each January at ——— o'clock p. m., and the first regular annual meeting shall be held at that place on the ——— day of ———, at ——— o'clock p. m.

SEC. 4. SPECIAL MEETINGS.—Special meetings of the members may be called by the president whenever he or the board of directors shall deem such action necessary; and such meetings must be called by him for any special purpose upon petition of one-fourth the number of members.

SEC. 5. NOTICE.—At least five days' notice, in writing, shall be given each member of the time and place of each annual meeting, and of the time, place and purpose for which the meeting is called in the case of special meetings.

SEC. 6. ORDER OF BUSINESS.—The order of business at any regular meeting shall be as follows:

1. Roll call.
2. Reading and adoption of the minutes of the last meeting.
3. Reports of officers.
4. Reports of committees.
5. Election of directors.
6. Miscellaneous business.

SEC. 7. BUSINESS OF SPECIAL MEETINGS.—No business shall be transacted at a special meeting except that for which the meeting was called.

SEC. 8. QUORUM.—At any annual or special meeting 12 members shall constitute a quorum.

SEC. 9. VOTE.—At any annual or special meeting each member shall have one vote on all questions. In case of a tie the president shall cast the deciding vote. A majority vote of the members present shall be necessary to carry any question.

SEC. 10. PROXY.—No member shall be allowed to vote by proxy.

ARTICLE II.—DIRECTORS.

SECTION 1.—NUMBER, ELECTION, AND TERM.—Nine directors shall be elected by ballot at the first annual meeting of the members, to succeed the temporary board. Three directors shall be elected for three years, three for two years, and three for one year. At each annual meeting thereafter three directors shall be elected to serve for three years, or until their successors are elected.

SEC. 2. VACANCIES.—Vacancies on the board of directors may be filled by the remaining directors until the next annual meeting of the members, when a director shall be elected to serve for the unexpired term.

SEC. 3. EXECUTIVE COMMITTEE.—The executive committee of the board of directors shall be composed of the president, secretary-treasurer, and one other director designated by the board.

SEC. 4. MEETINGS.—The executive committee shall meet at least once a month, and oftener if necessary, and meetings of the entire board shall be held at the call of the president.

SEC. 5. QUORUM.—Five directors shall constitute a quorum at any meeting of the board.

SEC. 6. COMPENSATION.—The directors shall receive compensation at the rate of \$— for each day of eight hours actively employed in the interests of the company,

SEC. 7. ELECTION OF OFFICERS.—Immediately after the annual meeting of the members, the board of directors shall elect a president and a vice-president from their own number, and a secretary-treasurer who may or may not be a member of the board.

SEC. 8. APPOINTMENT OF MANAGER AND COMMITTEES.—The board of directors shall appoint, and may dismiss for cause, a manager who may or may not be a member of the company, or at their discretion the secretary-treasurer may also be the manager. They may appoint committees on financing, construction, etc., and it shall be their duty once a year, at least 30 days before the annual meeting of the members, to appoint an auditing committee to consist of three members of the company who are not officers.

SEC. 9. BOND.—The board of directors shall require the secretary-treasurer and may require other officers and employees charged by the company with responsibility for the custody of its funds or property, to give bond with sufficient surety for the faithful performance of such duties.

SEC. 10. SALARIES OF OFFICERS AND EMPLOYEES.—The board shall fix the salary of officers and the wages of all other employees of the company. No officer shall receive the per diem allowed the directors in addition to his salary.

SEC. 11. SEAL.—The board may devise and adopt an appropriate seal, and cause the same to be affixed to all documents whereto the company is a party.

SEC. 12. RECALL.—Any director, for just cause set forth at any annual meeting or special meeting called for that purpose, may be removed from office by a two-thirds vote. Such director shall be informed in writing of the charges made against him, at least 10 days before the date of such meetings, and shall have an opportunity to be heard in person, by counsel, and by witness in regard thereto.

ARTICLE III.—OFFICERS.

SECTION 1. TERM.—Each officer, unless removed by a two-thirds vote of the board, shall hold office for one year or until his successor has been elected.

SEC. 2. DUTIES OF THE PRESIDENT.—The president shall preside at all the meetings of the members and of the board; shall sign, execute, and deliver all legal papers pertaining to the business or property of the company; shall sign all notes, checks (certificates of stock), etc.; and shall perform such other and further duties as the board may direct.

SEC. 3. DUTIES OF THE VICE PRESIDENT.—In the absence or disability of the president, the vice president shall act.

SEC. 4. DUTIES OF THE SECRETARY-TREASURER.—The secretary-treasurer shall attend all the meetings of the members and of the directors, and shall keep, in books provided for that purpose, a correct record of the proceedings of each meeting.

(He shall keep the books of the blank certificates of stock; fill out and countersign all certificates issued, and make the corresponding entries on the stub of each certificate. He shall keep a proper transfer book, and a stock ledger showing the number of such shares issued to and transferred by the members.)

He shall receive all moneys paid to the company and give his receipt therefor, and shall pay out the same under the direction of the board; shall keep in a suitable book an accurate account thereof, and make a detailed report in writing at the annual meeting of the members, and at such other times as the board may designate. He shall make all reports and serve all notices required by the directors or by law or by these by-laws.

He shall be custodian of all the records and papers of the company; shall have charge of and affix the company's seal to all such documents as require attestation; and shall countersign all notes, checks, and other papers.

At the expiration of his term of office he shall turn over to his successor all the property of the company in his hands and take his receipt therefor.

SEC. 5. DUTIES OF THE MANAGER.—The manager shall have charge of the operation, inspection, and maintenance of the lines and equipment of the company, under the general direction of the board.

He shall appoint and may discharge all operators and other employees necessary for the proper conduct of the company's business, and such operators and employees may or may not be members of the company.

ARTICLE IV.—COMMITTEES.

SECTION 1. DUTIES OF AUDITING COMMITTEE.—It shall be the duty of the auditing committee to meet at least two weeks before the annual meeting of the members. They shall make a thorough examination of all the records and accounts of the officers for the preceding year and shall make a report thereon at the annual meeting.

SEC. 2. DUTIES OF OTHER COMMITTEES.—It shall be the duty of any other committee appointed to perform such work as may be assigned to it by the board, and to make a report thereof at the annual meeting next following.

(ARTICLE V.—ISSUANCE AND TRANSFER OF STOCK.)

(SECTION 1. ISSUANCE.—All applications for stock shall be submitted, with the recommendations of the secretary-treasurer and manager, to the executive committee for its approval, before any stock shall be issued to the applicant.)

(SEC. 2. CERTIFICATES.—The certificates of stock of this company shall be issued in such form as the board of directors may designate. Such certificates shall be signed by the president and countersigned by the secretary-treasurer, and shall bear the seal of the company. They shall exhibit the holder's name, the date of issuance, and the value of the share.)

(SEC. 3. TRANSFER.—Stock of the company may be transferred with the approval of the board of directors when removal or discontinuance of service makes such transfer desirable. The surrendered certificate shall be canceled before a new certificate shall be issued in lieu thereof. The receiver of the new certificate shall not already own stock in the company, except as hereinbefore provided, and shall be required to sign the by-laws.)

ARTICLE (VI) V.—FINANCES.

SECTION 1. FISCAL YEAR.—The fiscal year of this company shall commence on _____ and end on _____.

SEC. 2. ASSESSMENTS.—Every three months, in _____, _____, _____, and _____, the board of directors shall estimate the financial requirements of the company, and shall levy an assessment upon the members in proportion to the number of telephones charged to each.

(SEC. 2. RENTAL CHARGES.—Each member shall pay into the treasury, for each and every telephone accredited to him, the sum of \$_____ quarterly in advance. A discount of _____ per cent shall be allowed for payment of rental charges within 10 days after same become due. If such rental is not paid within 30 days after it becomes due, service shall be discontinued until payment is made.)

SEC. 3. SYSTEM OF ACCOUNTING.—The accounts of this company shall be kept in accordance with the rules laid down by the Interstate Commerce Commission, and of the State commission ² having jurisdiction over the business of telephone companies.

(SEC. 4. USE OF CAPITAL FUNDS.—The funds collected from the sale of stock of this company shall be used only for the building and extension of the company's lines and for the installation of the stations of new members or subscribers.)

(SEC. 5. USE OF INCOME.—The income received from rental charges, tolls, etc., shall be used in defraying the expenses of operation and the regular repair and upkeep of the lines.)

(SEC. 6. DEPRECIATION RESERVE.—Out of the annual income of the company, exclusive of capital funds, _____ per cent shall be set aside as a depreciation reserve, to be used for replacing the system as it wears out.)

SEC. 4. POWER TO BORROW MONEY.—The board of directors shall have power to borrow money at its discretion not exceeding the total sum of \$_____. Loans in excess of that amount must have the consent of two-thirds of the members at any annual or special meeting.

¹ See list on p. 29.

ARTICLE (VII) VI.—RULES FOR SERVICE AND THE USE OF LINES.

SECTION 1. HOURS OF SERVICE.—The operator of the switchboard shall be on duty from — o'clock a. m. to — o'clock p. m., on week days, and from — to — o'clock a. m. and — to — o'clock p. m., on Sundays and holidays.

SEC. 2. EMERGENCY CALLS.—Emergency calls made out of regular hours will be charged for at the rate of 25 cents per call. The operator shall receive four-fifths of the amount collected for such calls, in addition to any other salary or wages.

SEC. 3. GENERAL CALLS.—A general call for all members, — rings, may be made at any time by any member having information of particular value to all. This privilege, however, must be used sparingly.

SEC. 4. USE OF LINES BY OUTSIDERS.—No member shall allow his telephone to be used by an outsider, other than the members of his immediate family, his employees, or guests of his household, without collecting a charge of not less than 10 cents for each such call. All such calls shall be charged against the member whose telephone is used and shall be paid for by him at the quarterly payment date.

SEC. 5. TIME ALLOTMENT.—No person shall be allowed the use of the line for more than five minutes if another party is waiting to use it.

SEC. 6. PRECEDENCE OF CALLS.—Ordinary conversation may be interrupted when the use of the line is required for the transmission of business or professional messages. In such cases the use of the line should be courteously requested.

SEC. 7. IMPROPER LANGUAGE.—No abusive, profane, or obscene language shall be used over the lines of this company.

SEC. 8. LISTENING IN.—No person shall take down the receiver for the purpose of listening to a conversation which is not intended for him. If the receiver is taken down and the line is found to be busy, it should be immediately replaced, except in the case of an urgent business or professional call.

SEC. 9. ENFORCEMENT.—It shall be the duty of each member to see that the provisions of this article are rigidly enforced, and to report any and all violations thereof to the manager.

ARTICLE (VIII) VII.—PENALTIES.

Any member who fails to observe the rules and regulations of this company, as set forth in these by-laws, or who fails to pay any charges made against him in accordance herewith for 30 days after having received notice that such are due, shall have his service discontinued until he shall have assured the board of directors in writing of his intention to observe such rules in the future or until he shall have met his obligations to the company.

ARTICLE (IX) VIII.—AMENDMENT.

These by-laws may be amended by a two-thirds vote of all the members present at any regular annual meeting, or at any special meeting called for that purpose, a quorum being present, 10 days' notice of such proposed amendment having been given each member in writing.

LIST OF COMMISSIONS HAVING JURISDICTION OVER TELEPHONE COMPANIES.

State.	Name of commission.	Location.
Alabama.....	Public service commission.....	Montgomery.
Arizona.....	Corporation commission.....	Phoenix.
Arkansas.....	do.....	Little Rock.
California.....	Railroad commission.....	San Francisco.
Colorado.....	Public utilities commission.....	Denver.
Connecticut.....	do.....	Hartford.
Florida.....	Railroad commission of the State.....	Tallahassee.
Georgia.....	Railroad commission.....	Atlanta.
Idaho.....	Public utilities commission.....	Boise.
Illinois.....	State public utilities commission.....	Springfield.
Indiana.....	Public service commission.....	Indianapolis.
Iowa.....	Railroad commission.....	Des Moines.
Kansas.....	Public utilities commission.....	Topeka.
Kentucky.....	Railroad commission.....	Frankfort.
Louisiana.....	do.....	Baton Rouge.
Maine.....	Public utilities commission.....	Augusta.
Maryland.....	Public service commission.....	Baltimore.
Massachusetts.....	Department of public utilities.....	Boston.
Michigan.....	Public utilities commission.....	Lansing.
Minnesota.....	Railroad and warehouse commission.....	St Paul.
Mississippi.....	Railroad commission.....	Jackson.

LIST OF COMMISSIONS HAVING JURISDICTION OVER TELEPHONE COMPANIES—Contd.

State.	Name of commission.	Location.
Missouri.....	Public service commission.	Jefferson City.
Montana.....	do.	Helena.
Nebraska.....	State railway commission.	Lincoln.
Nevada.....	Public service commission.	Carson City.
New Hampshire.....	do.	Concord.
New Jersey.....	Public utilities commission.	Trenton.
New Mexico.....	State corporation commission.	Santa Fe.
New York.....	Public service commission.	Albany.
North Carolina.....	Corporation commission.	Raleigh.
North Dakota.....	Board of railway commissioners.	Bismarck.
Ohio.....	Public utilities commission.	Columbus.
Oklahoma.....	Corporation commission.	Oklahoma City.
Oregon.....	Public service commission.	Salem.
Pennsylvania.....	do.	Harrisburg.
Rhode Island.....	Public utilities commission.	Providence.
South Carolina.....	Railroad commission.	Columbia.
South Dakota.....	do.	Pierre.
Tennessee.....	do.	Nashville.
Utah.....	Public utilities commission.	Salt Lake City.
Vermont.....	Public service commission.	Battleboro.
Virginia.....	State corporation commission.	Richmond.
Washington.....	Department of public works.	Olympia.
West Virginia.....	Public service commission.	Charlestown.
Wisconsin.....	Railroad commission.	Madison.
Wyoming.....	Public service commission.	Cheyenne.
United States.....	Interstate Commerce Commission.	Washington, D. C.

